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HYDROCARBON ANALYSIS FOOTNOTES

2/94, Rev. 3

VOLATILE HYDROCARBONS - GASOLINE RANGE ORGANICS

- G 1 This sample appears to contain extractable diesel range organics.
- G 2 The chromatogram for this sample does not resemble a typical gasoline pattern. Please refer to the sample chromatogram.
- G 3 The total hydrocarbon result in this sample is primarily due to an individual compound(s) eluting in the volatile hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.
- G 4 This sample contains compound(s) not identified as Benzene, Toluene, Ethyl benzene or Xylene.
- G 5 This sample appears to contain or be saturated with gasoline product.

EXTRACTABLE HYDROCARBONS - DIESEL RANGE ORGANICS

- D 1 This sample appears to contain volatile gasoline range organics.
- D 2 The hydrocarbons present in this sample resemble heavy, non-resolvable oil range organics. Quantitation by TPH-Diesel Extended or TPH 418.1 is recommended.
- D 3 The hydrocarbon concentration result in this sample is partially due to an individual peak(s) eluting in the diesel / motor oil carbon range.
- D 4 The hydrocarbons present in this sample are a complex mixture of diesel range and heavy oil range organics.
- D 5 The hydrocarbon result shown is an estimated (greater than) value due to the high concentration. Reanalysis is being performed to yield a quantitative result. An amended report will follow.
- D 6 The sample chromatographic pattern does not resemble the fuel standard used for quantitation. A fuel fingerprint is advised.

	Oils and Lubricants	
	TRPH 418.1	
Diesel & Fuel Oils	1	
Extractable Hydrocarbons (TPH-D)]	

Volatile Hydrocarbons (TPH-G)

HYDROCARBON BOILING POINT RANGE

LOW LOW TO MEDIUM MEDIUM

MEDIUM TO HIGH

VERY HIGH

CARBON RANGE:

B - 44 10 10 20 21 22 22 24 25 26 27 28 20 30 31 ±



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GeoEngineers, Inc. 8410 154th Avenue N.E.

Redmond, WA 98052 Attention: Jim Roth

Client Project ID: UNOCAL Marysville, #6357

Sample Matrix: Soil

Analysis Method: WTPH-D

Units: mg/kg (ppm)

Analyst:

T. Fitzgibbon

Extracted: Analyzed:

Oct 6, 1995 Oct 6-7, 1995

Reported:

Oct 9, 1995

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

PRECISION ASSESSMENT Sample Duplicate

Diesel Range Hydrocarbons

Spike Conc.

Added:

Diesel

68

Spike

Result:

69

%

Recovery:

101

Upper Control

Limit %:

Lower Control

Limit %:

125

72

Sample

Number: B510097-01

Original

Result:

N.D.

Duplicate

Result: N.D.

Relative Percent Difference values are not

% Difference: reported at sample concentration levels

less than 10 times the Reporting Limit.

Maximum

RPD:

42

NORTH CREEK ANALYTICAL Incl

Laura Dutton Project Manager

Yama Dutter

% Recovery:

Spike Result

x 100

Spike Concentration Added

Relative % Difference:

Original Result - Duplicate Result

x 100

(Original Result + Duplicate Result) / 2

510102.GEO <8>

	NORTH	
Annual Control	CREEK	
ā	ANALYTICAL	8

j9 120	nue N.	ite 10	ell,	W	11-95(5) 481	FAX	92	
East 11115 M	lontgomery,	Suite B,	Spokane,	WA	99206-4779	(509) 924-9200	FAX	924-9290	
9405 S.	W. Nimbus	Avenue,	Beaverton	OR	97008-7132	(503) 643-9200	FAX	644-2202	

ANALYTICAL UNOCA	L	CH	AII	V C	F	CU	ST	OI	Y	R	EP	O]	RT									
UNOCAL INFORMATION				U-ANT FROME		ONSU						error (st.)		#04 mg ,ct 13 m		Orași Mira, 🗢	NAME OF TAXABLE PARTY.		Chain	of Custo	dy Reco	ord#:
Facility Number: SS #357	Fir	m: 6	さいと	NG	INE	TRS,	INC		Proje	ct Nu	mber:	01	61-	136.	100	1_		_ -				
Site Address: 6425 33 PD AnE 36	Ad	dress:	84	10	159	111	- A	E-1	NE										Quality /	Assurance	Data I	Level:
City, State, ZIP: MARYSVLILE, WA	-		KE	Dici	ONE	, 6	14	4	180	52)								Λ.	Standard	Summa	J arv
Site Release Number:			· 2/:	/ - <i>()</i>					Eox:	L'	:/- (101	- _O					-11	B: Stand			
Unocal Manager: HOWARD BRINKERHOFF	1111		3601				5		rax.		. ,	(-(/)		-	-		-	-11				
CERT INFO: (check one) o Evaluation o Remediation	(11)		Manage	-					1.4										Laborato	5 3		
o Detection o Demolition o Closure o Miscellaneous	Sa	mple	Collecti	on by:	45	TEO	Voi	i (L	Sign.	ciile	Nic	#				interessor.			10		1 2	1
	-) Ore	gon	Wasi	hingtor	Hydro	ocarbo	n Met	hods			-						-				· ·
SAMPLING DATE / MATRIX # OF CON	-t-HCID	TPH-Gas	BTEX (EPA 8020 Mod.)	IPH-Oiss + BILEA	H-Diesel	Extended TPH-418.1	logen. Volatiles PA 8010)	omatic Volatiles PA 8020)	ncides/PCBs PCBs Only	/MS Volatiles PA 8240/8260)	PA 8270)	HS BY HFLC PA 8310)	Lead: Total or Dissolved	(a) create (b)						×		
SAMPLE IDENTIFICATION TIME (W,S,O) TAINERS		TP	E E			N E	로핀	A A	Pes o	<u>β</u> ₩	8 म	K E	1 5	-	-	-	_	-	1	A SAMPI		
1. SP-1-1 10.5.95/1445 SOIL /					X									_	110	1	1)	_	100	10/0) [-	-0/
2. SP-2-1 /1500 /				X										1	HC	14	1		-		(02
				X											IA)/	N				(0?
3. SP-2-2 V/1505 V/	-11-					-	-								4-12		1	-11				
4.	_ -	_					-								+	-	-	-				
5.														_				_				
6.	1	-				-	1	-	-									-11				
7.	- -	-					-	-								-						
8.	_ _					_		-	ļ							_						
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9.												-				1						
10.				- Extraorate		-	Open Contraction															
Relinquished by: Firm! Date & Time. 1. Lus von Wallung GE 10595 1780	1	ceived	L	1	FI J C	rm: 7	,	10/5	Jaty 8		172	V	Vere al		inal R					ye	s no	Defi
The von Walling Co 13/113													Vere re	sults w	vithin r	eque	sted to	urnar	ound?	ye	s no	.N.
2.														Fi	inal Ap	ргоч	al Sig	natur	e:	auconnie.		on ba
Page of Comments: Harse lived sample	P	(1)-1	7/	0117	TAN	Lp cl	121)	It A	Do	T7+				•			013				ot
Rev. 2.2, 11/94 Rev. 2.2, 11/94 Comments. A GO/NO & O /A' Distribution: White - Laboratory Yellow	0/07	97/5					8 -	01	100	KU	(F	irm:							Date	:	

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GeoEngineers

OCT 05 1995

Routing YSF 11 File 16(-436

Dear Consultant:

Enclosed please find your UNOCAL project and chain of custody. To help better serve you and UNOCAL, Inc., we would appreciate your cooperation in taking a few moments to fill in the "Final Report Approval" section of the Chain of Custody (bottom right hand corner) and faxing it back to North Creek Analytical, at (206) 485-2992 Attention: Bethany White. This allows us to proceed with invoicing to UNOCAL.

We appreciate your assistance in helping us with this request.

NORTH CREEK ANALYTICAL, Inc.

Administrative Department



18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132

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(503) 643-9200 • FAX 644-2202

GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052

Attention: Jim Roth

Project Name: Client Project: UNOCAL Marysville, #6357

#0161-436-R04 (1.1)

NCA Project #:

B509532

Received:

Sep 26, 1995

Reported:

Oct 3, 1995

PROJECT SUMMARY PAGE

		0	Data	GeoEngineers
Laboratory Sample Number	Sample Description	Sample Matrix	Date Sampled	OCT 0 5 1995
B509532-01	FI1-1-3.5	Soil	9/26/95	Routing)
B509532-02	FI1-1-5.5	Soil	9/26/95	
B509532-03	FI1-4-3.5	Soil	9/26/95	
B509532-04	FI2-1-3.5	Soil	9/26/95	
B509532-05	FI2-4-3.0	Soil	9/26/95	
B509532-06	PL-1-3.0	Soil	9/26/95	
B509532-07	PL-2-3.5	Soil	9/26/95	
B509532-08	PL-3-3.0	Soil	9/26/95	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

NORTH CREEK ANALYTICAL Inc.

Yama Duttm

Laura Dutton Project Manager 18939 120th Avenue N.E., Suite 101 • Botheii, WA 98011-9508 (206) 481-9200 • FAX 485-2992 East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290 (503) 643-9200 • FAX 644-2202

9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132

GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052

Attention: Jim Roth

Client Project ID:

UNOCAL Marysville, #6357

Sample Matrix:

Soil

First Sample #:

B509532-01

Received:

Sep 26, 1995 Oct 3, 1995

Reported:

TOTAL SOLIDS & MOISTURE CONTENT REPORT

Sample Number	Sample Description	Total Solids %	Moisture Content %
B509532-01	FI1-1-3.5	92	8.0
B509532-02	FI1-1-5.5	94	6.0
B509532-03	FI1-4-3.5	90	10
B509532-04	FI2-1-3.5	93	7.0
B509532-05	FI2-4-3.0	93	7.0
B509532-06	PL-1-3.0	95	5.0
B509532-07	PL-2-3.5	94	6.0
B509532-08	PL-3-3.0	94	6.0

The enclosed analytical results for soils, sediments and sludges have been converted to a DRY WEIGHT reporting basis. To attain the wet weight "as received" equivalent, multiply the dry weight result by the decimal fraction of percent Total Solids.

NORTH CREEK ANALYTICAL Inc.

Yama Dutter

Laura Dutton Project Manager



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GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052 Attention: Jim Roth

Client Project ID:

UNOCAL Marysville, #6357

Sampled:

Sep 26, 1995 Sep 26, 1995

Sample Matrix: Analysis Method: First Sample #:

Soil WTPH-G B509532-01 Received: Analyzed:

9/29-10/2/95

Reported:

Oct 3, 1995

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
B509532-01	FI1-1-3.5	7,800	S-2
B509532-02	FI1-1-5.5	N.D.	97
B509532-03	FI1-4-3.5	N.D.	95
B509532-04	FI2-1-3.5	N.D.	99
B509532-05	F12-4-3.0	N.D.	96
B509532-06	PL-1-3.0	N.D.	98
B509532-07	PL-2-3.5	N.D.	97
B509532-08	PL-3-3.0	N.D.	99
BLK092995	Method Blank	N.D.	94

Reporting Limits

1.0

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.

Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).

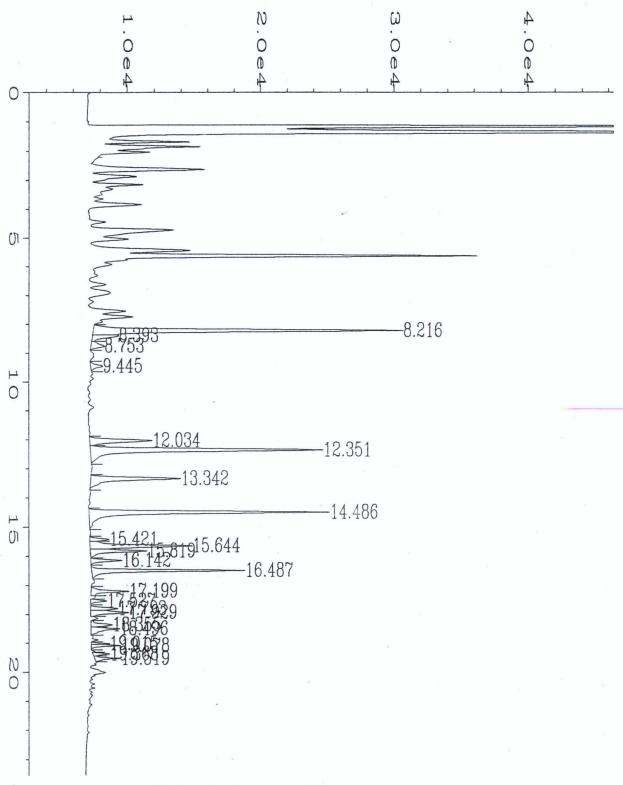
Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL In Please Note:

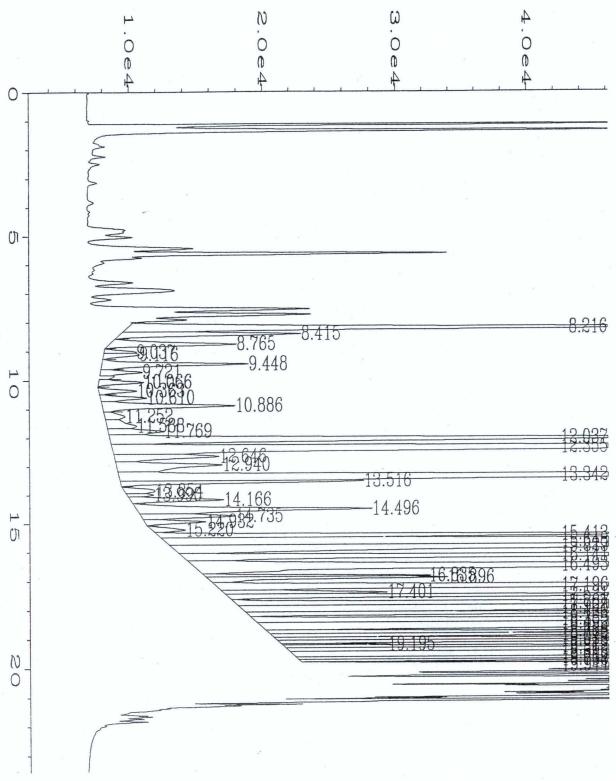
Yama Dutten

Laura Dutton Project Manager

S-2 = The Surrogate Recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.



```
Data File Name
                 : C:\HPCHEM\2\DATA\100295\002F0101.D
Operator
                                                Page Number
Instrument
                 : GC#6
                                                Vial Number
                                                                  : 2
                                                Injection Number: 1
Sample Name
                 : gas std
Run Time Bar Code:
                                                Sequence Line
                                                                  : 1
                                                Instrument Method: WA-WATER.MTH
Acquired on
                 : 02 Oct 95 08:36 AM
Report Created on: 02 Oct 95 09:00 AM
                                                Analysis Method : WA-WATER.MTH
Sample Info
                 : 500 ng V-8j
```

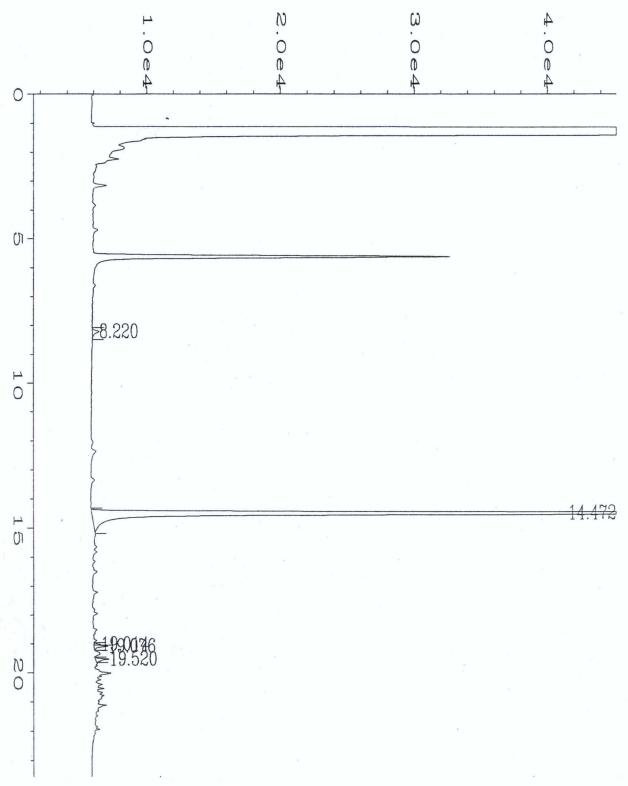


```
: C:\HPCHEM\2\DATA\100295\007F0101.D
Data File Name
                                                Page Number
Operator
                                                Vial Number
Instrument
                 : GC#6
                                                 Injection Number: 1
                 : b509532-01
Sample Name
                                                 Sequence Line
                                                                  : 1
Run Time Bar Code:
                                                 Instrument Method: WA-SOIL.MTH
Acquired on
                 : 02 Oct 95 12:13 PM
                                                Analysis Method : WA-SOIL.MTH
Report Created on: 02 Oct 95 12:37 PM
Multiplier
                 : 20
```

Sample Info

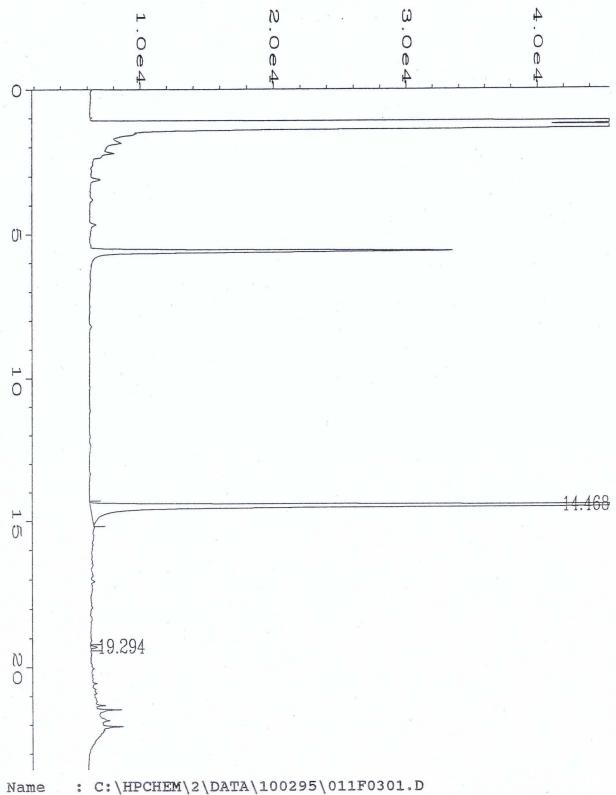
: 5 ul

B - 52



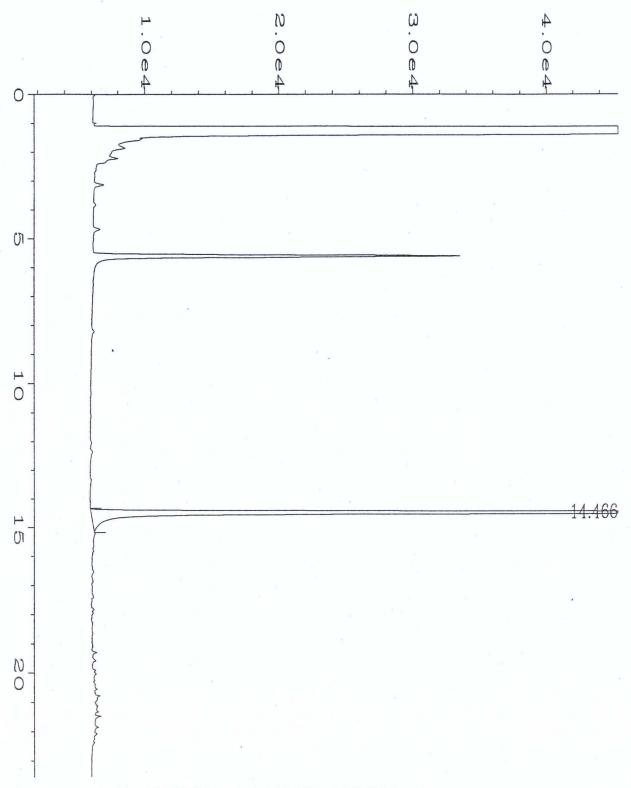
```
Data File Name
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Operator
                                                 Page Number
Instrument
                                                 Vial Number
                 : GC#6
Sample Name
                 : b509532-02 r1
                                                 Injection Number: 1
Run Time Bar Code:
                                                 Sequence Line
                                                                  : 6
Acquired on
                 : 02 Oct 95
                                                 Instrument Method: WA-SOIL.MTH
                              06:36 PM
Report Created on: 02 Oct 95
                              06:59 PM
                                                 Analysis Method : WA-SOIL.MTH
```

Sample Info : 100 ul

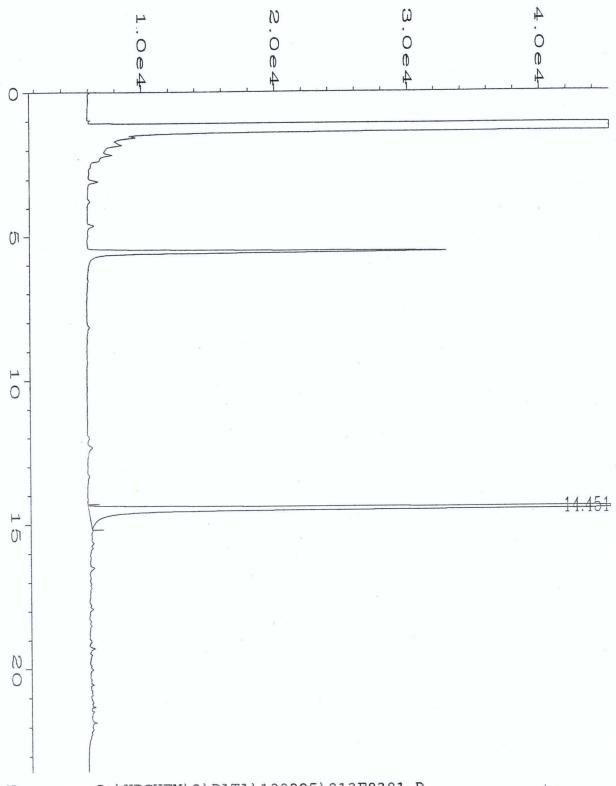


```
Data File Name
                                                 Page Number
Operator
                                                 Vial Number
                                                                  : 11
                 : GC#6
nstrument
                                                 Injection Number: 1
Sample Name
                 : b509532-03
                                                 Sequence Line
                                                                  : 3
Run Time Bar Code:
                                                 Instrument Method: WA-SOIL.MTH
                 : 02 Oct 95 02:11 PM
cquired on
leport Created on: 02 Oct 95 02:35 PM
                                                 Analysis Method : WA-SOIL.MTH
```

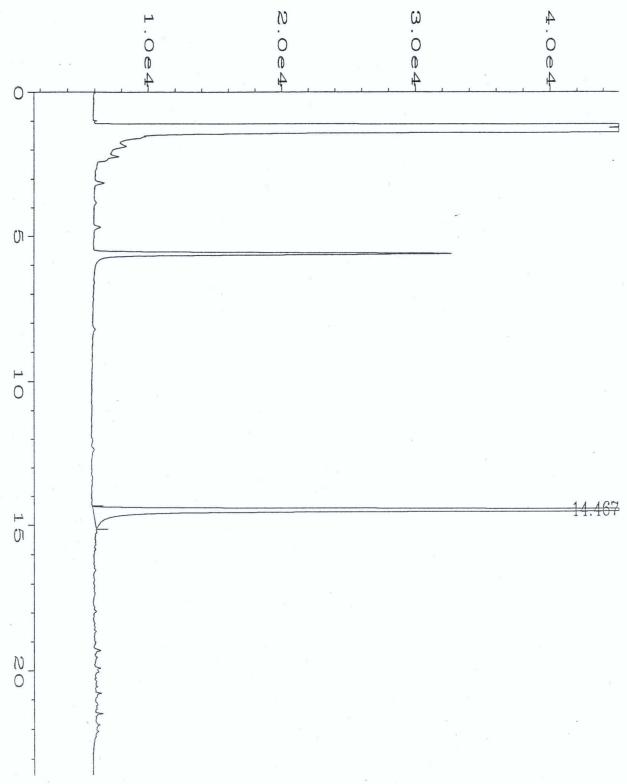
Sample Info : 100 ul



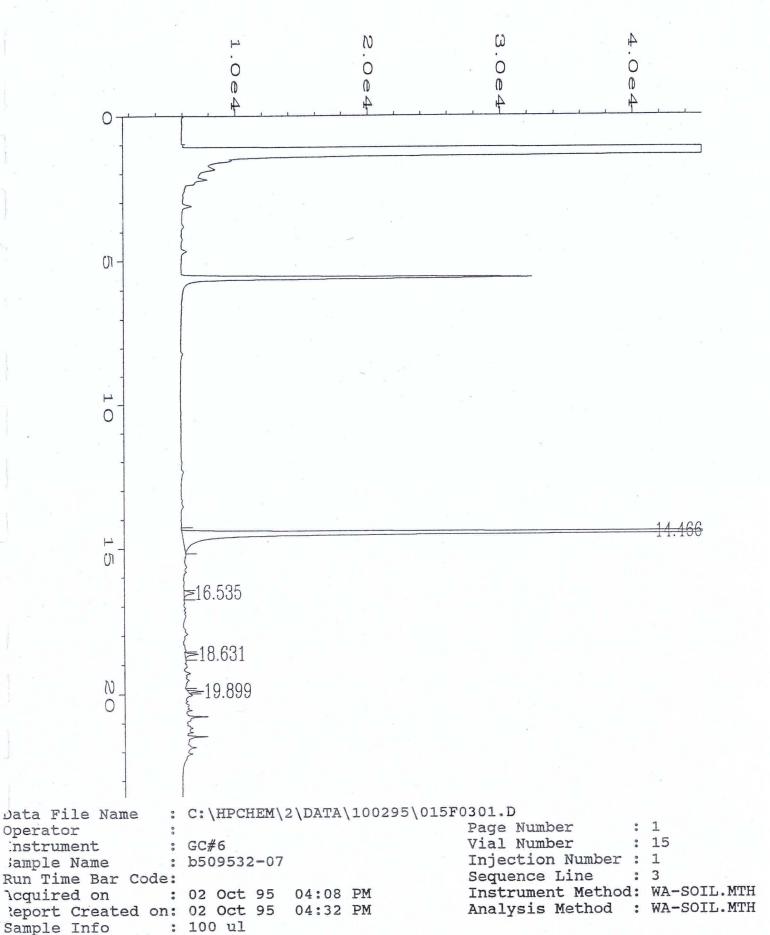
```
: C:\HPCHEM\2\DATA\100295\012F0301.D
Data File Name
                                                Page Number
Operator
Instrument
                                                Vial Number
                 : GC#6
Sample Name
                 : b509532-04
                                                Injection Number: 1
Run Time Bar Code:
                                                Sequence Line
                                                                 : 3
Acquired on
                                                Instrument Method: WA-SOIL.MTH
                              02:40 PM
                 : 02 Oct 95
Report Created on: 02 Oct 95
                              03:04 PM
                                                Analysis Method : WA-SOIL.MTH
Sample Info
                : 100 ul
```

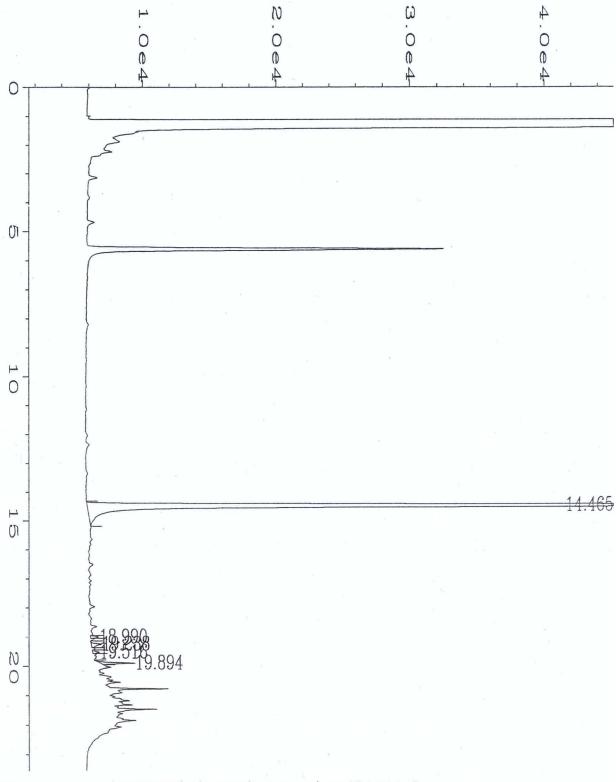


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                                                Page Number
Operator
                                                Vial Number
                                                                 : 13
Instrument
                 : GC#6
                                                Injection Number: 1
                : b509532-05
Jample Name
                                                                : 3
                                                Sequence Line
Run Time Bar Code:
                                                Instrument Method: WA-SOIL.MTH
                 : 02 Oct 95 03:10 PM
Acquired on
Report Created on: 02 Oct 95
                                                Analysis Method : WA-SOIL.MTH
                              03:33 PM
             : 100 ul
Sample Info
```



```
Data File Name
                 : C:\HPCHEM\2\DATA\100295\014F0301.D
Operator
                                                Page Number
                                                                  : 1
Instrument
                 : GC#6
                                                Vial Number
                                                                 : 14
                                                Injection Number: 1
                 : b509532-06
Sample Name
Run Time Bar Code:
                                                Sequence Line
                                                                 : 3
Acquired on
                                                Instrument Method: WA-SOIL.MTH
                 : 02 Oct 95 03:39 PM
Report Created on: 02 Oct 95 04:03 PM
                                                Analysis Method : WA-SOIL.MTH
                 : 100 ul
Sample Info
```





Data File Name : C:\HPCHEM\2\DATA\100295\016F0301.D Page Number Operator : 1 Vial Number Instrument : GC#6 : 16 Sample Name : b509532-08 Injection Number: 1 Sequence Line Run Time Bar Code: : 3 Instrument Method: WA-SOIL.MTH Acquired on : 02 Oct 95 04:38 PM Analysis Method : WA-SOIL.MTH Report Created on: 02 Oct 95 05:02 PM

Sample Info : 100 ul



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GeoEngineers, Inc.

Attention: Jim Roth

8410 154th Avenue N.E. Redmond, WA 98052

Client Project ID: UNOCAL Marysville, #6357

Sample Matrix: Soil

Analysis Method: WTPH-G

Units: mg/kg (ppm)

Analyst:

B. Christlieb

F. Shino

Analyzed:

9/29-10/2/95

Reported: Oct 3, 1995

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Gasoline

PRECISION ASSESSMENT Sample Duplicate

Gasoline Range Hydrocarbons

Spike Conc.

Added:

5.0

Spike

Result:

3.6

%

Recovery:

72

Upper Control Limit %:

Lower Control Limit %:

115

33

Sample

Number: B509532-08

Original

Result:

N.D.

Duplicate

Result:

N.D.

Relative Relative Percent Difference values are not

% Difference reported at sample concentration levels

less than 10 times the Detection Limit.

Maximum

RPD:

67

NORTH CREEK ANALYTICAL In [

Yaura Dutten

Laura Dutton Project Manager % Recovery:

Spike Result

x 100

Spike Concentration Added

Relative % Difference:

Original Result - Duplicate Result

x 100

(Original Result + Duplicate Result) / 2



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GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052 Attention: Jim Roth

Client Project ID:

UNOCAL Marysville, #6357

Sampled: Received: Sep 26, 1995 Sep 26, 1995

Sample Matrix: Analysis Method: First Sample #:

EPA 8020 B509532-01 Analyzed: Reported:

9/29-10/2/95 Oct 3, 1995

BTEX DISTINCTION

Soil

Sample Number	Sample Description	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg	Surrogate Recovery %
÷ 8		(ppm)	(ppm)	(ppm)	(ppm)	
B509532-01	FI1-1-3.5	N.D. (R.L. = 0.40)	24	18	220	S-2
B509532-02	FI1-1-5.5	N.D.	N.D.	N.D.	N.D.	109
B509532-03	FI1-4-3.5	N.D.	N.D.	N.D.	N.D.	104
B509532-04	Fl2-1-3.5	N.D.	N.D.	N.D.	N.D.	108
B509532-05	Fl2-4-3.0	N.D.	N.D.	N.D.	N.D.	106
B509532-06	PL-1-3.0	N.D.	N.D.	N.D.	N.D.	110
B509532-07	PL-2-3.5	N.D.	N.D.	N.D.	N.D.	109
B509532-08	PL-3-3.0	N.D.	N.D.	N.D.	N.D.	110
BLK	Method Blank	N.D.	N.D.	N.D.	N.D.	101

Reporting Limits:	0.050	0.050	0.050	0.10	*	

4-Bromofluorobenzene surrogate recovery control limits are 34 - 166 %. Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL In Please Note:

S-2 = The Surrogate Recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.

Yama Dutter

Laura Dutton Project Manager 18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 (206) 481-9200 • FAX 485-2992 East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290

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B. Christlieb Analyst:

F. Shino

Analyzed: Reported:

Sep 29, 1995 Oct 3, 1995

GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052

Attention: Jim Roth

Client Project ID: UNOCAL Marysville, #6357

Sample Matrix: Soil

Analysis Method: EPA 8020

Units: mg/kg (ppm)

QC Sample #: B509504-01

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	
Sample Result:	N.D.	N.D.	N.D.	N.D.	
Spike Conc. Added:	0.58	0.58	0.58	1.75	
Spike Result:	0.47	0.45	0.47	1.44	
Spike % Recovery:	81%	78%	81%	, 82%	-
Spike Dup. Result:	0.48	0.46	0.48	1.48	
Spike Duplicate % Recovery:	83%	79%	83%	85%	
Upper Control Limit %:	111	118	120	128	
Lower Control Limit %:	59	55	61	55	
Relative % Difference:	2.1%	2.2%	2.1%	2.7%	
Maximum RPD:	17	16	17	17	

NORTH CREEK ANALYTICAL In % Recovery:

Yalla Dutton

Laura Dutton Project Manager

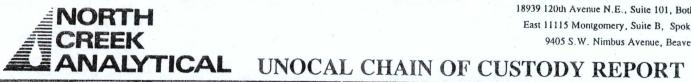
Spike Result - Sample Result

x 100

Spike Conc. Added

Relative % Difference:

Spike Result - Spike Dup. Result (Spike Result + Spike Dup. Result) / 2 x 100



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UNOCAL INFORMATION	CONSULTANT INFORMATION	Chain of Custody Record #:
Facility Number: 35 #6357	Firm: GEOENGINETERS INC. Project Number: 0/61-436-204 (11)	Chain of Custody Record #:
Site Address: 6425 33 P. AVE SE	Address: 8410 154 TH Ave NE	Ovellan Assurance Data I and
City, State, ZIP: MARYSVILLE, WA	REDITIONS, WA	Quality Assurance Data Level:
Site Release Number:	98052	
Unocal Manager: HOWARD BRINKERHOFF	Phone: 861-6000 Fax: 361-6050	A: Standard Summary
CERT INFO: (check one) o Evaluation o Remediation	Project Manager: Jini Xo 224	B: Standard + Chromatograms
CERT INFO: (check one) o Evaluation o Remediation O Detection Demolition o Closure o Miscellaneous	Sample Collection by: THETO VON (NALLHENICH	Laboratory Turnaround Days:
	O Oregon Washington Hydrocarbon Methods	
	s s s s s s s s s s s s s s s s s s s	,
SAMPLE IDENTIFICATION SAMPLE IDENTIFICATION TIME (W,S,O) TAINERS	TPH-HCID TPH-Gas BTEX (EPA 8020 Mod.) TPH-Gas - BTEX TPH-Diesel TPH-Diesel TPH-18.1 Halogen. Volatiles (EPA 8010) Aromatic Volatiles (EPA 8020) Pesticides/PCBs or PCBs Only GC/MS Volatiles (EPA 8270) GC/MS Semi-Volatiles (EPA 8270) PAHS by HPLC (EPA 8210) Lead: Total or Dissolved TCLP Metals (8)	NCA SAMPLE NUMBER
1. FI1-1-3.5 9.2495/1043 SOIL 1		B509532-01
2.FI1-1-5.5 //1600 /		-02
3. FI1-4-3.5 /1145		-03
4. FI2-1-3.5 /1330		- 04
s. FI2-4-3.0 / 1405		-05
6. PL-1-3.0 / 1305		-06,
1. PL-2-3.5 / 1520		-07
8. PL-3-3.0 V /1530 V		-08
ý.		
10.		
Refinquished by: Pirus: Date & Time 1. Les multalle 68 9.76.95 505pm 2.	Were results within requested turnar	yes no Define ound? yes no 'No'
	Final Approval Signatur	C
Page of Comments:	Final Approval Signatur	on back



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(509) 924-9200 • FAX 924-9290

(503) 643-9200 • FAX 644-2202

GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052 Project Name:

UNOCAL Marysville, #6357

Client Project:

#0161-436-R04 (1.1)

NCA Project #:

B509475

Received:

Sep 25, 1995

Reported:

Sep 26, 1995

PROJECT SUMMARY PAGE

Laboratory Sample Number

Attention: Jim Roth

Sample Description Sample Matrix Date Sampled

SEP 28 1995

GeoEngineers

Routing

ile . 161-436

B509475-01

TP-1-SEEP

Water

9/25/95

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton

Project Manager

Laura Dutter



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GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052 Attention: Jim Roth

Client Project ID: Sample Matrix: Analysis Method:

First Sample #:

UNOCAL Marysville, #6357

Water WTPH-G B509475-01

Sampled: Sep 25, 1995 Sep 25, 1995 Received:

Analyzed: Sep 25, 1995 Sep 26, 1995 Reported:

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result µg/L (ppb)	Surrogate Recovery %
B509475-01	TP-1-SEEP	N.D.	103
BLK092595	Method Blank	N.D.	120

Reporting Limit:

50

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %. Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane). Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Jama Dutton

Laura Dutton

Project Manager



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GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052 Attention: Jim Roth

Client Project ID: UNOCAL Marysville, #6357

Sample Matrix: Water

Analysis Method: WTPH-G

Units: µg/L (ppb)

Analyst:

B. Christlieb

F. Shino

Analyzed:

Sep 25, 1995

Sep 26, 1995 Reported:

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Gasoline

PRECISION ASSESSMENT Sample Duplicate

Gasoline Range Organics

Spike Conc. Added:

100

Sample

Number: B509475-01

Spike

Result:

115

Original

Result:

N.D.

%

Recovery:

115

Duplicate Result:

N.D.

Relative Percent Difference values are not

less than 10 times the Detection Limit.

% Difference reported at sample concentration levels

Upper Control

Lower Control

Limit %:

Limit %:

132

56

Maximum

RPD:

50

NORTH CREEK ANALYTICAL In [

Varia Dutten

Laura Dutton Project Manager % Recovery:

Spike Result

x 100

Spike Concentration Added

Relative % Difference:

Original Result - Duplicate Result

x 100

(Original Result + Duplicate Result) / 2



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GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052 Attention: Jim Roth

Client Project ID: Sample Matrix:

First Sample #:

UNOCAL Marysville, #6357 Water

Analysis Method: EPA 8020 B509475-01

Sampled: Received:

Sep 25, 1995 Sep 25, 1995 Sep 25, 1995

Analyzed: Reported: Sep 26, 1995

BTEX DISTINCTION

Sample Number	Sample Description	Benzene µg/L (ppb)	Toluene μg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes μg/L (ppb)	Surrogate Recovery %
B509475-01	TP-1-SEEP	N.D.	N.D.	N.D.	N.D.	102
BLK092595	Method Blank	N.D.	N.D.	N.D.	N.D.	110

Danastina Limita	0.50	0.50	0.50	1.0	
Reporting Limits:	0.50	0.50	0.50	1.0	

4-Bromofluorobenzene surrogate recovery control limits are 59 - 144 %. Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton Project Manager

James Dutter

509475.GEO <4>

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GeoEngineers, Inc. 8410 154th Avenue N.E. Client Project ID: UNOCAL Marysville, #6357

Analyst:

B. Christlieb F. Shino

Redmond, WA 98052 Attention: Jim Roth

Sample Matrix: Water Analysis Method: EPA 8020

Analyzed:

Sep 25, 1995

Units: µg/L (ppb)

QC Sample #: B509376-04

Reported:

Sep 26, 1995

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	
-	A				· ·
Sample Result:	N.D.	N.D.	N.D.	N.D.	
Spike Conc. Added:	10.0	10.0	10.0	30.0	
Spike Result:	11.4	10.5	10.3	30.1	
Spike % Recovery:	114%	105%	103%	100%	
Spike Dup. Result:	11.3	10.4	10.2	30.0	
Spike Duplicate % Recovery:	113%	104%	102%	100%	
Upper Control Limit %:	115	116	122	122	
Lower Control Limit %:	82	81,	85	85	
Relative % Difference:	<1.0%	1.0%	1.0%	<1.0%	
Maximum RPD:	16	16	16	17	
NORTH CREEK AN	ALYTICAL In [% Recovery:		Result - Sample Re	

Vauca Dutter

Laura Dutton Project Manager Spike Conc. Added

Relative % Difference:

Spike Result - Spike Dup. Result (Spike Result + Spike Dup. Result) / 2 x 100



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GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052 Attention: Jim Roth

Client Project ID: Sample Matrix:

UNOCAL Marysville, #6357

Water

Analysis Method: WTPH-D Extended

First Sample #: B509475-01

Sampled: Sep 25, 1995 Received: Sep 25, 1995

Extracted: Sep 25, 1995 Analyzed: Sep 25-26, 1995

Reported: Sep 26, 1995

TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE EXTENDED

Sample Number	Sample Description	Diesel Result mg/L (ppm)	Heavy Oil Result mg/L (ppm)	Surrogate Recovery %
B509475-01	TP-1-SEEP	N.D.	N.D.	81
BLK092595	Method Blank	N.D.	N.D.	81

Reporting Limit:

0.25

0.75

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150%.

Extractable Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24) and Heavy Oil Range Organics (>C24). Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton

Project Manager

Laura Dutten



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GeoEngineers, Inc. 8410 154th Avenue N.E. Redmond, WA 98052

Attention: Jim Roth

Client Project ID: UNOCAL Marysville, #6357

Sample Matrix: Water Analysis Method: WTPH-D

Units: mg/L (ppm)

T. Fitzgibbon Analyst:

Extracted: Sep 25, 1995 Analyzed: Sep 25, 1995

Sep 26, 1995 Reported:

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Diesel

PRECISION ASSESSMENT Sample Duplicate

Diesel Range Organics

Spike Conc. Added:

2.00

Spike

Result:

1.83

92 Recovery:

Upper Control

Limit %:

Lower Control Limit %:

119

74

Sample

Number: B509337-01

Original

Result:

0.58

Duplicate

Result:

0.44

Relative Relative Percent Difference values are not

% Difference reported at sample concentration levels

less than 10 times the Reporting Limit.

Maximum

RPD:

44

NORTH CREEK ANALYTICAL In [

Saina Sutter Laura Dutton

Project Manager

% Recovery:

Spike Result Spike Concentration Added x 100

Relative % Difference:

x 100

Original Result - Duplicate Result (Original Result + Duplicate Result) / 2

NORTH CREEK ANALYTICAL

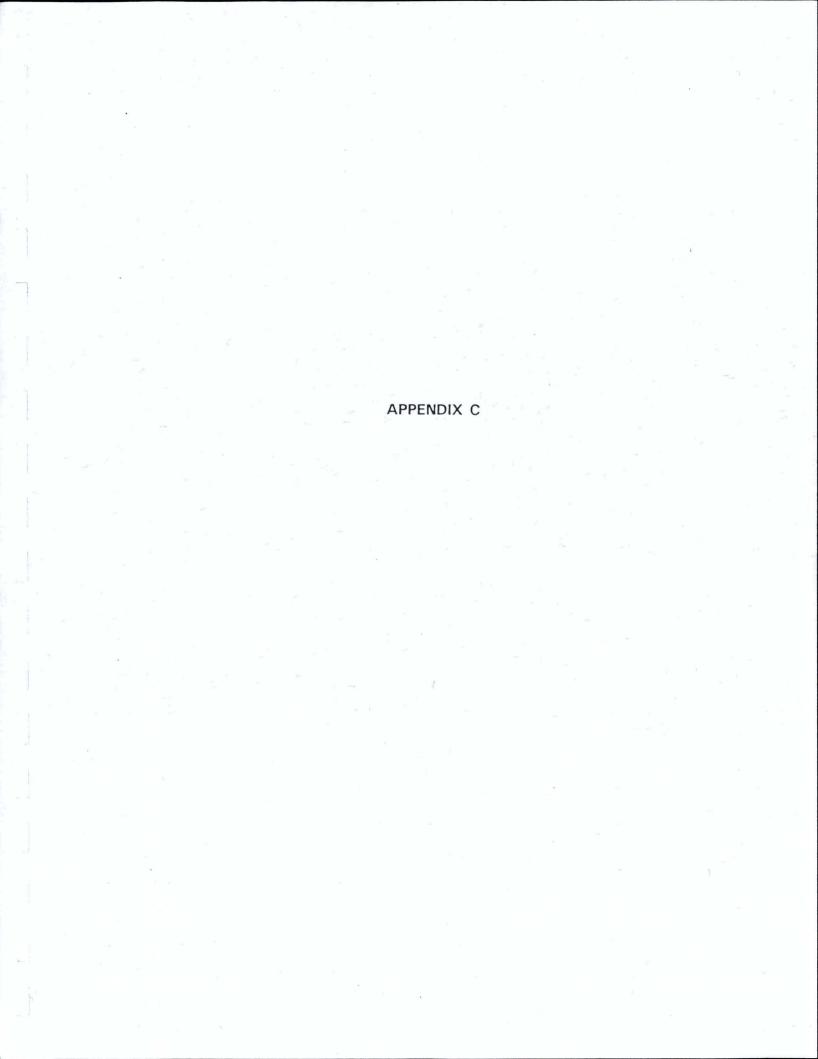
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UNOCAL	CHAIN	OF	CUSTOD	Y	REP	ORT
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Facility Number: 55#				Firm: GEOENGINEERS, NC Project Number										er: 0161-936-R04 (1.1)													
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INSTRUCTIONS:

When a release has not been confirmed and reported, this Site Check/Site Assessment Checklist must be completed and signed by a person registered with the Department of Ecology. The results of the site check or site assessment must be included with this checklist. This form must be submitted to Ecology at the address shown below within 30 days after completion of the site check/site assessment.

<u>SITE INFORMATION:</u> Include the Ecology site ID number if the tanks are registered with Ecology. This number may be found on the tank owner's invoice or tank permit.

<u>TANK INFORMATION:</u> Please list all the tanks for which the site check and site assessment is being conducted. Use the tank ID number if available, and indicate tank capacity and substance stored.

REASON FOR CONDUCTING SITE CHECK/SITE ASSESSMENT: Please check the appropriate item.

CHECKLIST: Please initial each item in the appropriate box.

<u>SITE ASSESSOR INFORMATION:</u> This form must be signed by the registered site assessor who is responsible for conducting the site check/ site assessment.

Underground Storage Tank Section Department of Ecology P. O. Box 47655 Olympia, WA 98504-7655

site assessment.	Olympia, WA 98504-7655
SITE INFORMATION Site ID Number (on invoice or available from Ecology if the tar Site/Business Name: UNOCAL SERVICE STATION No. 6	•
Street	One: (360) 435-477 WGTON 98270 ZIP-Code
TANK INFORMATION Tank ID No. Tank Capacity 1 10,000 - GALLONS 2 10,000 - GALLONS 4 550 - GALLONS 1D NUMBER 550 - GALLONS	Substance Stored UNLEADED GASOLINE UNLEADED GASOLINE WASTE OIL HEATING OIL
Check one: Investigate suspected release due to on-site environment investigate suspected release due to off-site environment investigate suspected release due to on-site environment investigate suspected release due to on-site environment investigate suspected release due to on-site environment investigate environment investigate suspected release due to on-site environment investigate environment investigate environment investigate environment investigate suspected release due to on-site environment investigate environment investigat	ronmental contamination. ronmental contamination. e than 12 months. ed.

CHEC Each it	KLIST em of the following checklist shall be initialed by the person registered with the Department of I	Ecolog	y
whose	signature appears below.	YES	
1.	The location of the UST site is shown on the vicinity map.	TW	
2.	A brief summary of information obtained during the site inspection is provided. (see Section 3.2 in the Site Assessment Guidance)	TW	
3.	A summary of UST system data is provided. (see Section 3.1)	TW	
4.	The soils characteristics at the UST site are described. (see Section 5.2)	TW	
5.	Is there apparent groundwater in the tank excavation?		TW
6.	A brief description of the surrounding land is provided. (see Section 3.1)	TW	
7.	Information has been provided indicating the number and types of samples collected, methods used to collect and analyze the samples, and the name and address of the laboratory used to perform the analyses.	TW	
8.	A sketch or sketches showing the following items is provided:		
	- location and ID number for all field samples collected	TW	
	- groundwater samples distinguished from soil samples (if applicable)	TW	
	- samples collected from stockpiled excavated soil	TW	
	- tank and piping locations and limits of excavation pit	TW	
	- adjacent structures and streets	TIM	
	- approximate locations of any on-site and nearby utilities		TNV
9.	If sampling procedures different from those specified in the guidance were used, has justification for using these alternative sampling procedures been provided? (see Section 3.4)	N	A
10.	A table is provided showing laboratory results for each sample collected including: sample ID number, constituents analyzed for and corresponding concentration, analytical method and detection limit for that method.	TW	
11.	Any factors that may have compromised the quality of the data or validity of the results are described.	TW	
12.	The results of this site check/site assessment indicate that a confirmed release of regulated substance has occured.	TW	
SITE	ASSESSOR INFORMATION		
		INC	
	THEO VON WALMENICH CEOUNGERS, PERSON REGISTERED WITH ECOLOGY FIRM AFFILIATED WITH	ГН	
DUIONIE	SS ADDRESS: 8410 154 TH AVENUE NE TELEPHONE: 1206 861-6	000)
BUSINE			
	REDMOND WASHINGTON 98052 CITY STATE ZIP+CODE		
I here descr WAC	by certify that I have been in responsible charge of performing the site check/site assessn ibed above. Persons submitting false information are subject to penalties under Chapter 1	nent 173-30	<i>50</i>

page 2

Signature of Person Registered with Ecology